

WHAT IS CLAIMED IS:

✓ 5 1. A non-aqueous electrolytic solution comprising at least two organic compounds dissolved in a solvent comprising a cyclic carbonate and a chain carbonate, in an amount of 0.01 to 8 weight % for each compound,

Sub 10 AI in which both of said two organic compounds have a reduction potential higher than those of the cyclic and chain carbonates, and

15 in which one of the organic compounds has a reduction potential equal to that of another organic compound or has a reduction potential lower or higher than that of another organic compound by a potential of less than 0.4 V.

20 2. The non-aqueous electrolytic solution of claim 1, in which each organic compound is dissolved in the solvent in an amount of 0.1 to 4 weight %.

25 3. The non-aqueous electrolytic solution of claim 1, in which said one organic compound has a reduction potential equal to that of another organic compound or a reduction potential lower or higher than that of another organic compound by a potential of less than 0.2 V.

Sub 30 A2 4. The non-aqueous electrolytic solution of claim 3, in which said one organic compound has a reduction potential equal to that of another organic compound or a reduction potential lower or higher than that of another organic compound by a potential of less than 0.05 V.

35 5. The non-aqueous electrolytic solution of claim 1, in which said one organic compound is a carbonate compound and another organic compound is a sultone compound, a sulfonate compound, or a sulfone compound.

Sub<sup>5</sup>  
A2  
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13. The non-aqueous electrolytic solution of claim 1, in which the chain carbonate is selected from the group consisting of dimethyl carbonate, diethyl carbonate, methyl ethyl carbonate, and methyl isopropyl carbonate.

14. The non-aqueous electrolytic solution of claim 1, which contains an electrolyte salt.

15. A non-aqueous lithium secondary battery which comprises a positive electrode comprising lithium complex oxide, a negative electrode comprising graphite, a non-aqueous electrolytic solution containing an electrolyte salt in a non-aqueous solvent, and a separator, in which the non-aqueous electrolytic solution comprises at least two organic compounds dissolved in a solvent comprising a cyclic carbonate and a chain carbonate, in an amount of 0.01 to 8 weight % for each compound, in which both of said two organic compounds have a reduction potential higher than those of the cyclic and chain carbonates, and in which one of the organic compounds has a reduction potential equal to that of another organic compound or has a reduction potential lower or higher than that of another organic compound by a potential of less than 0.4 V.

16. The non-aqueous lithium secondary battery of claim 15, in which each organic compound is dissolved in the solvent in an amount of 0.1 to 4 weight %.

17. The non-aqueous lithium secondary battery of claim 15, in which said one organic compound has a reduction potential equal to that of another organic compound or a reduction potential lower or higher than that of another organic compound by a potential of less than 0.2 V.

18. The non-aqueous lithium secondary battery of claim 15, in which said one organic compound has a reduction potential equal to that of another organic compound or a reduction potential lower or higher than that of another organic compound by a potential of less than 0.05 V.

19. The non-aqueous lithium secondary battery of claim 15, in which said one organic compound is a carbonate compound and another organic compound is a sultone compound, a sulfonate compound, or a sulfone compound.

20. The non-aqueous lithium secondary battery of claim 19, in which said one organic compound is vinylene carbonate or methyl propargyl carbonate and another organic compound is 1,3-propanesultone, 1,4-butanessultone, 1,4-butanediol dimethanesulfonate, or ethylene glycol dimethane sulfonate.

21. The non-aqueous lithium secondary battery of claim 19, in which said one organic compound is benzaldoxime methylcarbonate and another organic compound is divinyl sulfone.

22. The non-aqueous lithium secondary battery of claim 15, in which said one organic compound is a sulfonate compound and another organic compound is a sultone compound.

23. The non-aqueous lithium secondary battery of claim 22, in which said one organic compound is 1,4-butanediol dimethanesulfonate or ethylene glycol dimethane sulfonate, and another organic compound is 1,3-propanesultone or 1,4-butanessultone.

24. The non-aqueous lithium secondary battery of claim 15, in which said one organic compound is phenylacetylene, and another organic compound is vinylene carbonate, 1,3-propanesultone, or 1,4-butanedisultone.

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25. The non-aqueous lithium secondary battery of claim 15, in which the solvent comprises 5 to 70 volume % of the cyclic carbonate and 95 to 30 volume % of the chain carbonate.

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26. The non-aqueous lithium secondary battery of claim 15, in which the cyclic carbonate is selected from the group consisting of ethylene carbonate, propylene carbonate, and butylene carbonate.

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27. The non-aqueous lithium secondary battery of claim 15, in which the chain carbonate is selected from the group consisting of dimethyl carbonate, diethyl carbonate, methyl ethyl carbonate, and methyl isopropyl carbonate.

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28. The non-aqueous secondary battery of claim 15, in which said graphite is natural graphite or artificial graphite.

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29. The non-aqueous secondary battery of claim 15, in which the graphite has a lattice plane of (002) having a plane distance in term of  $d_{002}$  in a length of 0.335 to 0.340 nm.

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